

What is claimed is:

1           1.       A method for predicting the time required to execute a database command,  
 2 comprising:  
 3           measuring a plurality of execution times to complete the database command;  
 4           recording the measured execution times, thereby creating a time historical record; and  
 5           using the time historical record to estimate the time required to execute the database  
 6 command.

1           2.       The method of claim 1, wherein said using the time historical record includes  
 2 analyzing the time historical record by using a statistical analysis technique to estimate the time  
 3 required to execute the database command.

1           3.       The method of claim 2, wherein said analyzing the time historical record includes  
 2 computing an average execution time based upon information concerning the database command  
 3 from the time historical record.

1           4.       The method of claim 3, wherein the average execution time is  
 2  $AvT = \sum M(i) / N$ , where i is an integer and varies from 1 to N, N equals the number of  
 3 measurements recorded in the historical record of the execution time of the database command,  
 4 and M(i) is an ith measurement of the execution time of the database command.

1           5.       The method of claim 2, wherein said analyzing the time historical record includes  
 2 computing a moving range between prior measurements of the database command, based upon  
 3 information from the time historical record.

1           6.     The method of claim 5, wherein the moving range is  $MR(i)=M(i+1)-M(i)$ , where  $i$   
2 is an integer that varies from 1 to  $N$ , and  $M$  is a measurement of an execution time of the  
3 database command.

1           7.     The method of claim 2, wherein said analyzing the time historical record includes  
2 computing a maximum execution time.

1           8.     The method of claim 7, wherein said analyzing the time historical record includes  
2 computing the maximum execution time based upon a specified confidence value.

1           9.     The method of claim 8, wherein the specified confidence value is configurable  
2 based upon a probability that the database command will execute in less time than the computed  
3 maximum execution time.

1           10.    The method of claim 7, further comprising:  
2           executing the database command;  
3           measuring a time to execute the database command; and  
4           issuing a warning if the measured time to execute the database command exceeds the  
5 maximum execution time.

1           11.    The method of claim 10, wherein the warning is a warning that a configuration of  
2 the database may have changed.

1           12.    The method of claim 2, wherein said analyzing the time historical record includes  
2 computing a minimum execution time.

1           13.    The method of claim 12, wherein said analyzing the time historical record  
2 includes computing the minimum execution time based upon a specified confidence value.

1           14.    The method of claim 13, wherein the specified confidence value is configurable  
2 based upon a probability that the database command will execute in less time than the computed  
3 minimum execution time.

1           15.    The method of claim 12, further comprising:  
2           executing the database command;  
3           measuring a time to execute the database command; and  
4           issuing a warning if the measured time to execute the database command is less than the  
5 minimum execution time.

1           16.    The method of claim 15, wherein the warning is a warning that a configuration of  
2 the database may have changed.

1           17.    The method of claim 1, wherein said database command is a database utility  
2 command.

1           18.    The method of claim 17, further comprising recording within the time historical  
2 record the time of execution of said measured database utility command.

1           19.    The method of claim 18, further comprising recording within the time historical  
2 record the day of execution of said measured database utility command.

1           20.    The method of claim 17, further comprising recording within the time historical  
2 record a database utility command option executed with said measured database utility  
3 command.

1           21.    The method of claim 17, further comprising recording within the time historical  
2 record a processor load of a computer executing said measured database utility command.

1           22.    The method of claim 17, further comprising recording within the time historical  
2 record a storage access load of a computer executing said measured database utility command.

1           23.    The method of claim 17, wherein using the time historical record further  
2 comprises selecting a historical record for analysis based upon one or more of the following:

- 3           a) the database utility command;
- 4           b) an option specified with a previously executed instance of the database utility  
5 command;
- 6           c) the time that the previously executed instance of the database utility command was  
7 executed;
- 8           d) the day that the previously executed instance of the database utility command was  
9 executed;
- 10          e) a processor load on a machine executing a previously executed instance of the database  
11 utility command; and
- 12          f) a storage access load on a machine executing a previously executed instance of the  
13 database utility command.

1           24.    The method of claim 1, further comprising determining if a plurality of database  
2    commands can execute within a fixed timeframe by analyzing each of the plurality of commands  
3    based on prior execution time measurements for each of the plurality of database commands.

1           25.    The method of claim 1, wherein said database command is a command for which  
2    a time required to execute has been estimated, the method further comprising:  
3            editing the database command;  
4            analyzing the time historical record using a statistical analysis technique to generate an  
5    estimate of the time required to execute the edited database command.

1           26.    The method of claim 1, wherein said database command is a command file  
2    containing a plurality of database commands.

1           27.    The method of claim 26, wherein times required to execute database commands  
2    within said command file have been estimated, the method further comprising:  
3            editing the database command file;  
4            analyzing the time historical record using a statistical analysis technique to generate new  
5    estimates of the time required to execute database commands contained within the edited  
6    command file.

1           28.    An apparatus for predicting the time required to execute a database command,  
2    comprising:  
3            a historical record module having recorded therein a plurality of measurements of  
4    execution times of the database command;  
5            an analysis module coupled to the historical record module and configured to analyze the  
6    measurements recorded in the historical record module; and

7 a utility scheduling module configured to determine whether to execute the database  
8 command based on an analysis of the database command measurements.

1 29. The apparatus of claim 28, wherein the analysis module is configured to  
2 statistically analyze the time historical record to estimate the time required to execute the  
3 database command.

1 30. The apparatus of claim 28, wherein the database command is a database utility  
2 command.

1 31. The apparatus of claim 30, wherein the utility scheduling module is configured to  
2 determine whether a plurality of database commands can execute within a fixed timeframe based  
3 on the analysis module analyzing measurements relating the plurality of measurements recorded  
4 in the historical record module.

1 32. The apparatus of claim 30, further comprising a user interface module configured  
2 for enabling a user to specify the database command to be analyzed.

1 33. An apparatus for predicting a time for executing a database command,  
2 comprising:  
3 means for measuring a time to complete the database command;  
4 means for recording the measured time, thereby creating a time historical record; and  
5 means for analyzing the time historical record to estimate the time required to execute the  
6 database utility command.

1           34.    The apparatus of claim 33, wherein said means for analyzing uses a statistical  
2 analysis technique to analyze the time historical record to estimate the time required to execute  
3 the database command.

1           35.    A computer program embodied on a computer readable medium for predicting a  
2 time for executing a database command, comprising:

3           program instructions for measuring a time to complete execution of the database  
4 command;

5           program instructions for recording the measured time, thereby creating a time historical  
6 record; and

7           program instructions for analyzing the time historical record to estimate the time required  
8 to execute the database utility command.

1           36.    The computer program of claim 35, wherein said program instructions for  
2 analyzing use a statistical analysis technique to analyze the time historical record to estimate the  
3 time required to execute the database command.